

Notes

North Star

Because the North Star is currently the star almost directly above Earth's North Pole, it appears stationary in the night sky. This can be demonstrated by having the students stand in place, notice what is over their heads, make one slow rotation (this will also tell you if they understand rotation), and look up to see their overhead view hasn't changed.

Sailors used the North Star to guide them especially when they were out of view of landmarks. Early explorers realized that the height of the North Star above the horizon was constant if you traveled directly east and west. This was translated in latitude on maps. Here in SE PA, we are at approximately 40 degrees North latitude – meaning we are 40 degrees above the Equator. Measuring up to the North Star from the horizon will give you 40 degrees.

Orion

The red star is a cool supergiant star. Its surface temperature is about 3400 degrees Kelvin, making it much cooler than our Sun (~6000 degrees Kelvin). It is a dying star having used up most of its fuel. It expands and contracts which changes its magnitude (measure of brightness) over a 6 year period. At its largest if placed in our Solar System, it would engulf Jupiter. It is about 650 light years away. Its name is Betelgeuse, which is probably a misspelling of its Arabic name which meant the Hand of the Central One. It is commonly thought that Betelgeuse stands for the Shoulder of the Giant.

The blue star at Orion's left foot is Rigel, another supergiant – only as big as the orbit of Mars. Its blue color tells us its surface temperature is around 10,000 degrees K. Rigel is Arabic for the Left Foot of Orion and has been in continuous use since the 10th century. It is closer to 1000 light years away.

Harry Potter and Astronomy

Besides Sirius, J.K Rowling used several other names from astronomy. First and foremost, Draco Malfoy, Harry's nemesis. Then there is Draco's son, Scorpius. The star on Orion's left shoulder is Bellatrix – one of the leading Death Eaters is Bellatrix LeStrange. One of the first casualties of Voldemort is Regulus Arcturus Black (related to Sirius). Regulus is the bright star in Leo at the base of the question mark. Arcturus is the bright star of Bootes, the Bear Hunter. Andromeda Tonks is one of the good guys. If you like, research the Black family tree – you will find, besides Sirius and Regulus, Orion, Cassiopeia, Cygnus, stars Alpheratz (in the Serpent) and Pollux. As a side note, all of the astronomical names in the series are reserves for pure-blood wizards, no Muggles allowed.

Meteor Showers

In space anything smaller than an asteroid (think MiniCooper or bigger) is a meteoroid. When one enters our atmosphere, the shock of the air piling up in front of the object gives off the glow we see as a 'meteor'. If it is large enough to survive the trip through our atmosphere, it hits the ground and becomes a meteorite.

Meteor showers are a different phenomenon. As comets near our Sun in their very long orbits, the sun's heat and solar wind force particles of dust off into the tail that we traditionally think of when we say the word comet. These dust particles are left in space and some of them are in the Earth's orbital path. When our Earth runs into one of these dust trails, the tiny particles appear as bright streaks of light in the night sky. These are meteor showers. There are 10 major meteor showers that happen as we encounter the trails in space.

Jan. 1-5	Quadrantids	peak: Jan 3
April 16-25	Lyrids	Apr 22
Apr 19-May 8	Eta Aquarids	May 4
July 8- Sept 20	Delta Aquarids	July 29
July 17-Aug	24 Perseids	Aug 12
Sept 10-Oct 26	Orionids	Oct 22
Sept 15-Nov 26	Taurids	Nov 3
Nov 14-21	Leonids	Nov 17
Dec 7-17	Geminids	Dec 14
Dec 17-26	Ursids	Dec 22

They are named for the constellation they appear to be radiating from. The best view is around what is called the peak and the best viewing is in the time after midnight and before dawn when there is no moon in the sky.

Black Holes

First, Black Holes are not holes. Black Hole is the name given to a sphere of gravity so dense that not even light can escape its pull. It originally was a mathematical concept developed to figure out what would happen to all the energy of a super-massive star after it exploded in a

supernova. The idea was that all the energy would be concentrated into a point called the singularity surrounded by the gravity field of all that mass. The edge of the gravity field is called the event horizon and this is an area that can be imaged by looking for massive output of x-rays which are produced as anything crosses the event horizon. Cygnus X-1 was discovered during a survey of the sky being done with an x-ray telescope. It is now believed that all galaxies have super-massive black holes at their centers.